

# COMMAND BRIEFING



**Dr. Debra Yourick**



# **WRAIR -SILVER SPRING, MARYLAND**



# **WRAIR MISSION AND VISION**

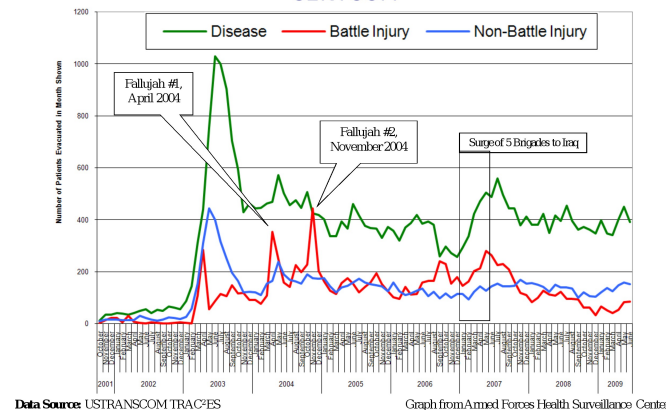
**Conduct global medical research to meet DoD requirements and deliver life-saving products to ensure combat effectiveness of the Warfighter.**

**Become the DoD research organization for the Centers of Excellence in Infectious Disease and Military Psychiatry & Neurosciences.**

# MILITARY MEDICAL RESEARCH: WHY?

- While battlefield injuries are a predictable outcome of wartime operations, disease and nonbattle injuries remain a major aspect of military healthcare planning
- Focus on the prevention and treatment of militarily-relevant infectious diseases: diarrhea, malaria, leishmania, dengue, etc.
- These same diseases are ones that have limited appeal to the commercial industry owing to business and n

Counts, by Year and Month, of Disease, Non-Battle Injuries, and Combat Injuries Among Service Members Medically Air Transported from CENTCOM



# KEY GLOBAL CHALLENGES



“..improve global surveillance and early warning capabilities and quickly enact control and containment measures against the next pandemic threat....

***We depend on U.S. overseas laboratories, relationships with host nation governments, and the willingness of states to share health data with nongovernmental and international organizations.”***  
(p.49)

# KEY GLOBAL CHALLENGES: GLOBAL HEALTH



**“The United States has a moral and strategic interest in promoting global health....**

**That is why we are continuing to invest in the fight against HIV/AIDS.....**

**And we are also pursuing the goal of reducing the burden of malaria and tuberculosis and seeking the elimination of important neglected tropical diseases. ” (p.39)**

# WRAIR TODAY

**1 Major U.S. Labs**

**3 Major Overseas Locations**



***~2,000 military/civilian, research/support personnel***

# WRAIR'S R&D FOCUS

## CENTERS OF EXCELLENCE

**Military  
Infectious  
Disease  
Research**

**Military  
Psychiatry and  
Neuroscience**



# CENTER FOR MILITARY INFECTIOUS DISEASE RESEARCH

## Black Multiplier CA Partners with Laboratories

## Management of the epidemiology/Prevention/Prognosis to reduce transmission of VBD

# HIV Etiology Database/Repository/Surveillance Network



# MALARIA

## Military Malaria Research Program (MMRP)



- Drugs and Vaccines
- President's Malaria Initiative (PMI)
- Phase III: RTS,S vaccine in children
- IV artesunate
- Surveillance for drug resistant *P. falciparum*
- New antimalarial drugs

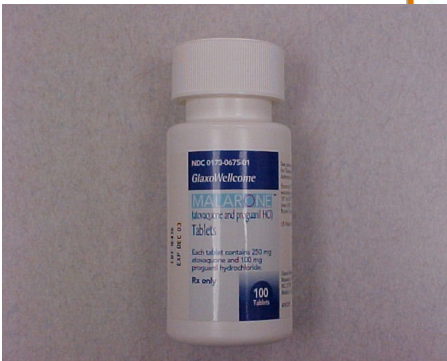
# ANTI MALARIAL DRUGS FROM THE DOD

## In use

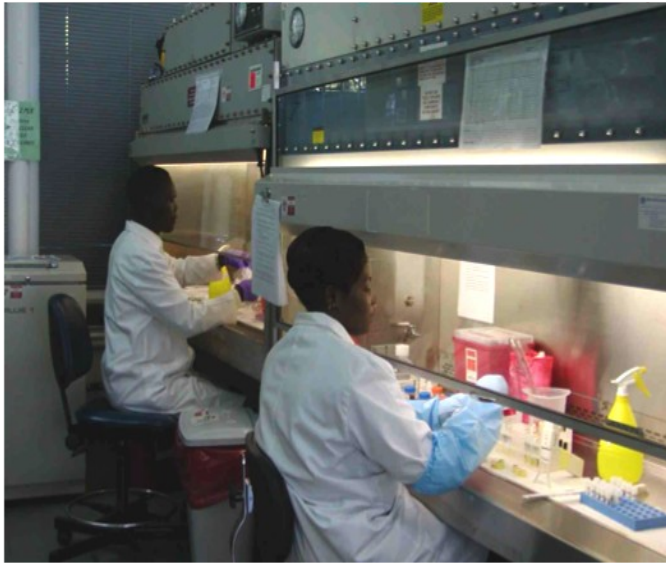
- Chloroquine
- Primaquine
- Chloroquine-Primaquine (*CP tabs*)
- Mefloquine (*Lariam®*)
- Doxycycline (*Vibramycin®*)
- Atovaquone/Proguanil (*Malarone®*)

## In later-stage development

- IV Artesunate
- Tafenoquine



## HIV:



**33 million cases/year**  
**2.1 million deaths/year**

**The U.S. Military HIV Research Program (MHRP) —based at WRAIR—aims to:**

- § Develop a GLOBALLY effective HIV-1 vaccine
- § Track the HIV epidemic in active-duty forces and assess risk of HIV exposure to U.S. and allied forces deployed overseas
- § Prevention, Care and Treatment

∅ Support the President's Emergency Plan for AIDS Relief (PEPFAR)

# Dengue



**50-100 million cases/year**  
**25,000 deaths/year**

## **Approaches:**

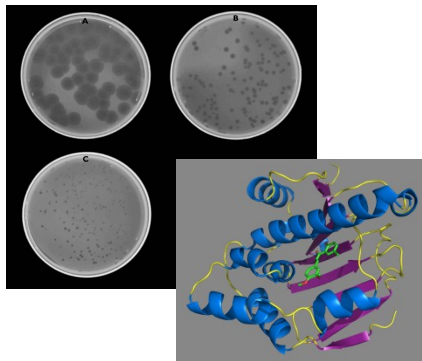
- Multiple vaccine candidates under evaluation
- Long partnerships - field sites with generations of volunteers (Thailand)
- Pediatric clinical trials pending/ongoing in southeast Asia and other endemic areas

# BACTERIAL DISEASES



## Diarrheal disease:

- 80-100 million cases/year
- 1.8 million deaths/year
- *Shigella*
- *meningitis*
- Multidrug resistant organisms
- Wound infections



## Approaches:

- Vaccines
- Therapeutics
- Diagnostics
- Structural biology

# LEISHMANIASIS



**1.5-2 million cases/year**  
**80 thousand deaths/year**

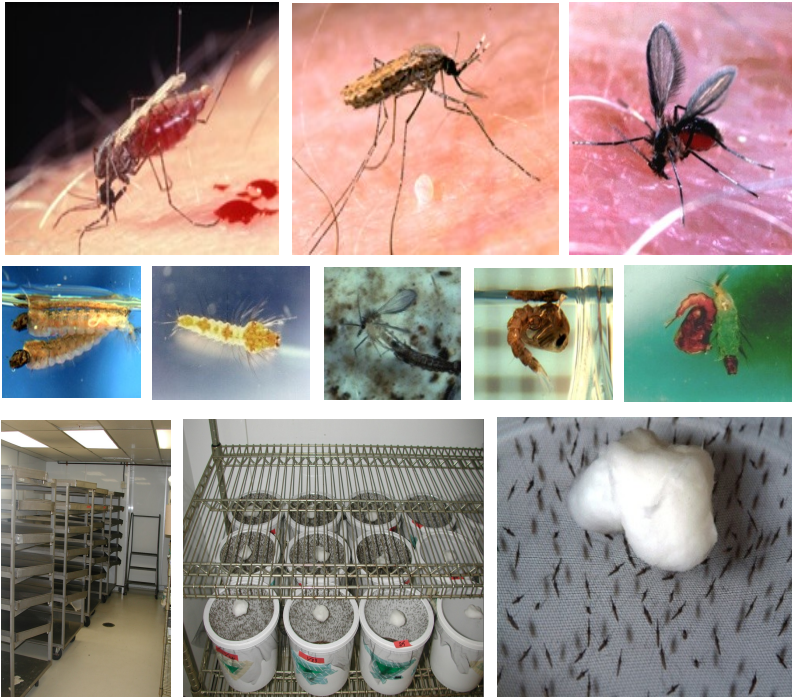


CAP-accredited diagnostic lab  
Device development to detect  
latent *Leishmania* sp.  
Infection

Experimental therapeutics  
Vector/sand fly dipstick assay

# VECTOR CONTROL

## R&D and testing of products to reduce vector-borne diseases



Sand fly and mosquito studies  
Mosquito challenge models

Malaria

Sand flies – Leishmaniasis

Vector control

Repellent development &  
testing

Bed nets

Vector Diagnostics  
Development

# WOUND INFECTIONS



**Support Wounded Warrior traumatic injury / infection and the military health care systems**

## **Approach:**

Novel therapies

Prevention

Pathophysiology

Diagnostics

Systems biology

Therapeutic intervention

Microbiome technologies applied to  
clinical requirements

MEDCOM Multi-Drug Resistant  
Repository and Surveillance  
Network (P8 funded; \$1.7M per  
annum)

# CENTER FOR MILITARY PSYCHIATRY AND NEUROSCIENCES

## Psychological Resilience



# BLAST EFFECTS ON THE BRAIN



## Identifying basic injury, mechanisms, modeling and therapy

- Actual blast studies to model the injury
- *In-vitro* & *in-vivo* models
- Kevlar effects - helmets and body armor
- DARPA-funded studies
- Physiology, neuropathology, multi-organ effects
- Experimental therapeutics



# ASSESSING PSYCHOLOGICAL RESILIENCE

## *MENTAL HEALTH ASSESSMENT TEAMS (MHAT), POST DEPLOYMENT HEALTH ASSESSMENT (PDHA)*



- **Land Combat Studies I and II:**
  - Large survey of BCT Soldiers pre and post combat
- **Annual MHATs:**
  - Iraq and Afghanistan/changed mental health delivery in theater
- **In-theater Debriefing:**
  - Determine whether time-driven debriefings in theater help with Soldier resilience
- **Emotional Disclosure:**
  - Determine whether emotional writing (versus factual or no writing) helps with post-combat transition
- **Neurocognitive Tests after Traumatic Brain Injury**

# WRAIR Overseas Laboratories



# WRAIR OPERATIONS IN EUROPE

## **U. S. Army Medical Research Unit Europe (USAMRU-E)**

### **Heidelberg, Germany**



Conducts applied psychological research to protect, optimize, and enhance Warfighter psychological resilience.

Examines the psychosocial influences on the causes, cure and prevention of psychiatric battle casualties.

“Human Dimension Research Team” gathers psychological and biomedical data with deployed units to determine the nature and extent of stressors on soldiers

Ascertains the health and performance consequences of stressors

Identifies factors that increase resiliency or vulnerability to stress

# WRAR OPERATIONS IN SOUTHEAST ASIA



## **Armed Forces Research Institute of the Medical Sciences (USAMC-AFRIMS) Bangkok, Thailand**

Conducted bench science, surveillance, and testing of infectious disease medical countermeasures and diagnostics

50-year partnership with the Royal Thai Army conducting infectious disease research

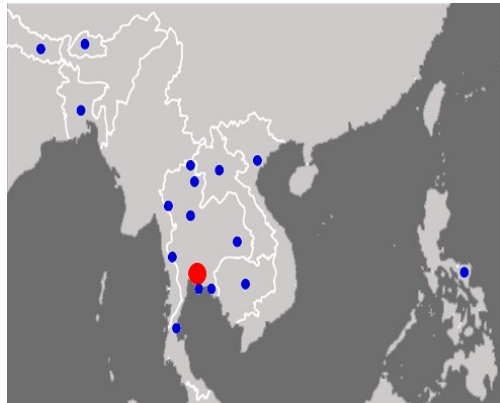
28 Active Duty U.S. Army personnel

350+ local employees

Malaria, dengue, Japanese encephalitis, scrub typhus, HIV, diarrheal diseases, vector control, disease surveillance (GEIS)

AAALAC-accredited animal facility with 600 nonhuman primates

BSL-3 laboratory, CAP certified



● **AFRIMS, Bangkok**      ● **Field & Study Sites**

# WRAIR OPERATIONS IN AFRICA



## **U. S. Army Medical Research Unit-Kenya (USAMRU-K)**

### **Nairobi, Kenya**

Conducting bench science, surveillance, and testing of infectious disease medical countermeasures and diagnostics

Approx. 40-year partnership with the Kenyan Government conducting infectious disease research

11 Active Duty U.S. Army personnel, 2 GS

> 300 local employees

Malaria, dengue, HIV, diarrheal diseases, vector control, disease surveillance (GEIS), PEPFAR

Capabilities in Kenya, Nigeria, Tanzania, and Uganda

R&D effort and PEPFAR

ondele Research Center, Nyanza Province



# FACILITIES: OUTPATIENT CLINICAL TRIALS

Muriithi-Welde Clinical Research Center,



Modern clinical research center: vaccine/drug studies, storage, etc.

Built with funding from multiple partners: US Army, MVI, USAID, GSK, etc.



# PEPFAR

- Ø Functions as an agency and an implementer
- Ø DoD HIV/AIDS Prevention Program (DHAPP), also serving as the PEPFAR Executive Agent for DoD, and the WRAIR/U.S. Military HIV Research Program (USMHRP)
- Ø DHAPP mil-mil: MHRP mil-mil & mil-civ
- Ø Direct DoD PEPFAR funding in focus countries:
  - 50% goes to military programs (many reaching civilian populations)
  - 50% goes to purely civilian programs
- Ø Programs cover the full spectrum of PEPFAR program areas (country dependent)
- Ø DoD provides direct TA to sites via clinical, lab, and prevention experts as well as administration (contracting, fiscal management)

# RAIR PREVENTION, CARE AND TREATMENT PROGRAMS IA U.S. MILITARY HIV RESEARCH PROGRAM

## Ø Kenya:

- South Rift Valley: +2.5 million people
- Kombewa District
- Kenya Department of Defence: 100K military + dependents

## Ø Nigeria:

- Nigerian Ministry of Defence: 380K active and retired military + dependents and ~1.5 million civilians

## Ø Tanzania:

- Southern Highlands: 6 million people
- Tanzania Peoples Defence Forces: 120K military + dependents and ~800K civilians

## Ø Uganda:

- Kayunga District: 300K+ people

# PROCUREMENT NEEDS & PROCESSES

## Ø What we need...

**Commercial Goods** – Laboratory and administrative materials and supplies, capital equipment , animals and animal supplies

**Construction Services** – Upgrades

**Integrated R&D and Non-personal Research Services**

## Ø How it's procured...

### **Commercial Items & Commercial Services**

- **Credit Card Orders**
- **Established Contracts**
- **New Contracts**

### **R&D**

- **Contracts (Procurement, SBIR, STTR)**
- **Grants & Cooperative Agreements (BAA)**
- **Cooperative Research and Development Agreements (CRADA)**
- **Commercial Test Agreements (CTA)**
- **Interagency Agreements**

# ACQUISITION: TO DATE AND FORECASTED

## To Date

### **Service contracts**

Approximately \$41M

### **Expendable medical**

Lab supplies, reagents

Approximately \$1M

### **Expendable medical/other credit card purchases**

Approximately \$10M

### **Construction - Renovation**

Approximately \$15M

## **Forecasted Acquisition**

\$5M (all types)

# WRAIR: A UNIQUE NATIONAL ASSET

## *Leveraging Capacity and Expertise to Serve the Soldier*

- Prominent Infectious Disease and Military Behavioral Health and Neurosciences Research Groups
- Only Malaria Drug Discovery/Development Program for the U.S.
- Close Partnerships with the State Dept and NIAID in HIV Research
- Other Partnerships: Gates, MVI, MMV, CDC, USAID, etc.
- Overseas Research Platforms – Europe, Asia, and Africa
- Pilot Bioproduction Facility—a Strategic DoD Asset
- Clinical Trials Centers on 3 Continents
- World-renowned programs in psychiatry, sleep management and neuroscience
- Well modeled and elegant preclinical work in brain injury
- AAALAC- Accredited Animal Facilities (US & Thailand)
- Surveillance network for wound infection pathogens

